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ABSTRACT

This summary report covers the findings of a survey of energy costs, types of fuel, and fuel consumption sent to 10,000 school district superintendents representing 96.5 percent of the students in the public school system. Responses were received from almost 3,000 districts. In addition to cost and consumption figures based on numbers of pupils, the study received and computed information on square-foot costs and consumption and on costs and consumption based on degree days. Fuel costs as a percentage of the total current budget were also computed. Four preliminary tables are included. The study represents the first major national effort to learn what the impact of rising fuel costs has been on education. (Author/MLF)

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FOREWORD

Several months ago the State Technical Assistance Office of the Federal Energy Administration, in coordination with the U.S. Office of Education in the Department of Health, Education and Welfare, conducted a national survey of public school district energy costs, types of fuel and consumption.

The survey was sent to 10,000 school district superintendents representing 43.5 million students or 96.5 percent of the students in our public school system. Responses were received from almost 3,000 districts.

The summary report which follows covers the findings of this survey; they are enlightening.

Realizing that increased fuel costs inevitably must be paid for with education dollars, it is hoped that the results of this survey will induce all school districts to institute effective energy management programs as soon as possible, to lessen the burden of higher energy costs.

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A REPORT TO SURVEY PARTICIPANTS

The median school district in the United States spent $29.77 per pupil for fuel in 1974-75 compared to $20.07 in 1972-73, before the Arab oil embargo. This represents an increase of $9.70 per pupil, or 48.3%, over the two years. At the same time, consumption dropped 3%.

But that tells only part of the story. Oil-dependent regions have been hit harder than most. For example, in New England the median expenditure for oil--the major heating fuel--increased 136% from $11.23 per pupil to $26.45 during the two years, despite the fact that consumption was cut almost 8%. In New York and New Jersey, median costs for oil rose 126% on a per pupil basis, while use of oil decreased 15%.

These facts are among a series of revealing statistics developed by the Federal Energy Administration (FEA) in a national survey of school district fuel costs and consumption. The study used figures supplied by a sample of 498 school districts, selected to represent the Nation as a whole.

Among other statistics developed by the study:

- The Nation's public schools spent an estimated $514 million more on fuel in 1974-75 than they did in 1972-73. At current salary rates, that represents about 43,000 teaching positions.*

- In New England, the extra cost of all fuel over the two-year period, had it been put back into school programs, could have provided another 4,900 teachers. New York and New Jersey could have added 8,300 teachers had districts in those States been able to hold fuel costs to 1972-73 levels. Districts in the Great Lakes States could have purchased the services of 9,900 teachers for the extra dollars spent on fuel.

- The cost per pupil of oil increased more rapidly (93% over the two years, nationally) than the cost of other fuels. The consumption of electricity increased by 10% despite the fact that its cost increased by more than 39%, or almost $5 per pupil.

- Gas-using regions of the United States were the least hard hit by increased fuel costs (ranging around a median increase of $5 per pupil) though some districts found themselves limited in the amount of fuel they could use.

*The comparison of additional teaching positions and fuel costs used here and in Table IV is simply one way of showing a relationship between fuel costs and school programs. It is not to suggest that money saved from fuel costs should be used to hire teachers.

- School districts in general (60.8% of them) reported that they lack money to undertake changes and modifications in buildings and in their heating and ventilating systems, needed to conserve fuel. Age of buildings (54.8% of those responding), lack of proper temperature controls (50.6%), and leaky windows (48.4%) were most often cited as principal obstacles that had to be overcome in order to conserve fuel.

- Because so many schools built in the last 10 years are air conditioned, school districts in warm climates now face severe problems when fuel costs rise. These districts, for the most part, depend on electric power for air conditioning, In the Southeast, for example, the median district increased its use of electricity by less than 20% but saw its costs rise by more than 49%.

In addition to cost and consumption figures based on numbers of pupils, the study received and computed information on square foot costs and consumption and on costs and consumption based on degree days. Fuel costs as a percentage of the total current budget were also computed. (In the median district nationally, the cost of fuel rose from 2.48% of the current budget to 2.84%. Its increase as a proportion of each district's discretionary budget is even greater.)

The FEA's study--made possible by the cooperation of so many individual school districts--represents the first major national effort to learn what the impact of rising fuel costs has been on education. Four preliminary tables are attached detailing the national median figures for individual fuels, based on per-pupil costs (Table I); national, regional and size-group medians for cost and consumption of all fuels based on per-pupil reporting (Table II); national, regional and size-group medians for cost and consumption of all fuels based on square-foot measures (Table III); and a summary chart, by region and size, showing the total effect of increased fuel costs over the two-year period (Table IV).

TABLE I

ENERGY COST/CONSUMPTION PER PUPIL NATIONALLY

Cost/pupil	25th Percentile	Median	75th Percentile	% Change of Median
1972-73				
Fuel Oil	$ 1.59	$ 5.52	$ 9.73	
Natural Gas	2.39	4.79	7.60	
Coal	.41	1.43	2.90	
Electricity	8.99	11.95	15.79	
Propane	.17	.36	.93	
Total Energy	15.23	20.07	26.23	
1974-75				
Fuel Oil	$ 2.81	$10.65	$22.54	92.9%
Natural Gas	3.39	6.75	10.63	40.9
Coal	1.04	2.50	5.88	74.8
Electricity	12.27	16.65	23.33	39.3
Propane	.23	.61	1.62	69.4
Total Energy	21.52	29.77	43.04	48.3
Consumption/pupil				
1972-73				
Fuel Oil (Gal.)	12.44	37.17	74.15	
Natural Gas (CF)	2,678.01	5,694.48	10,478.41	
Coal (Tons)	.03	.10	.26	
Electricity (Kwh)	350.32	507.60	707.53	
Propane (Gal.)	.60	2.04	6.59	
Total Energy (000'sBTU)	10,722.85	16,262.11	20,972.44	
1974-75				
Fuel Oil (Gal.)	8.96	33.33	66.99	-10.3
Natural Gas (CF)	2,558.42	5,813.01	10,037.84	2.0
Coal (Tons)	.03	.07	.28	-30.0
Electricity (Kwh)	393.61	558.80	747.48	10.0
Propane (Gal.)	.61	1.64	4.91	-19.6
Total Energy (000'sBTU)	10,745.67	15,768.78	20,409.47	-3.0

HOW TO READ THIS CHART: The median district, nationally, spent $5.52 per pupil for fuel oil in 1972-73; $10.65 per pupil in 1974-75, an increase of 92.9%. One quarter of the districts spent $1.59 per pupil or less in 1972-73. One quarter spent $9.73 or more that year. In 1974-75 the equivalent figures were $2.81 and $22.54.

NOTE: These figures are medians, not averages. Thus, it is not possible to add up the costs for each individual fuel to get a total fuel cost.

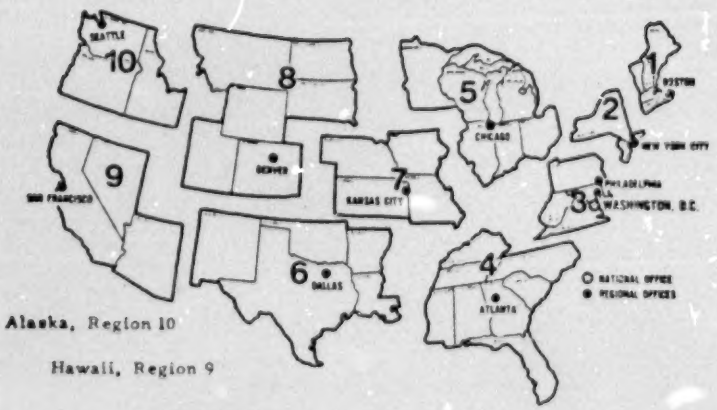
TABLE II

MEDIAN ENERGY COST/CONSUMPTION PER PUPIL
BY REGION AND DISTRICT SIZE

		$/Pupil, All Fuel			Consumption/Pupil, All Fuel		
		1972-73	1974-75	% Change	1972-73	1974-75	% Change
Nation		$20.07	$29.77	48.3%	16,262*	15,768	-3.0%
Region	1	$24.46	$47.14	92.7%	17,728	16,914	-4.5%
	2	28.06	48.04	71.2	18,893	18,826	-0.3
	3	23.52	39.21	66.7	17,848	18,369	2.9
	4	15.80	24.99	58.1	10,117	9,972	-1.4
	5	24.09	36.30	50.6	19,005	19,750	3.9
	6	15.06	20.89	38.7	13,517	13,152	-2.7
	7	21.33	26.13	22.5	17,973	18,574	3.3
	8	18.77	24.93	32.8	17,691	18,816	6.3
	9	14.96	20.67	38.1	10,309	9,089	-11.8
	10	19.57	27.00	37.9	19,671	17,185	-12.6
Size	1	$17.51	$26.78	52.9%	8,524	7,706	-9.5
	2	20.58	28.84	40.1	15,482	16,377	5.7
	3	18.72	30.98	65.4	16,477	15,713	-4.6
	4	21.03	34.02	61.7	16,508	16,554	0.2
	5	19.98	28.09	40.5	17,839	17,185	-3.6
	6	22.83	32.88	44.0	16,894	16,393	-2.9

*000's BTU's per student

Regions



Alaska, Region 10

Hawaii, Region 9

Size Groups

1 over 25,000 students
2 10,000 - 24,999
3 5,000 - 9,999
4 2,500 - 4,999
5 1,000 - 2,499
6 under 1,000

TABLE III MEDIAN COST AND CONSUMPTION OF ALL FUEL
PER 1,000 SQUARE FEET OF BUILDING

	Cost per 1,000 square feet (median)			Consumption per 1,000 square feet (median)* (in 000's of BTU's)		
	1972-73	1974-75	Percentage change	1972-73	1974-75	Percentage change
NATIONAL	$204.50	$286.04	39.8%	161,312	148,113	- 8.1%
REGION 1	262.76	437.77	66.6%	176,710	157,031	-11.1%
2	266.29	442.66	66.2%	185,999	171,487	- 7.8%
3	224.74	374.67	66.7%	166,069	152,559	- 8.1%
4	187.32	269.82	44.0%	112,013	109,568	- 2.1%
5	238.05	324.85	36.4%	184,948	171,972	- 7.0%
6	148.86	198.22	33.1%	132,603	137,354	3.5%
7	179.03	219.46	22.5%	163,245	142,522	-12.6%
8	171.68	243.61	41.9%	182,640	170,074	- 6.8%
9	205.85	269.17	30.7%	131,342	122,435	- 6.7%
10	168.26	233.09	38.5%	162,761	138,068	-15.1%
SIZE 1	177.43	260.11	46.6%	101,066	92,996	- 7.9%
2	219.07	304.44	38.9%	173,513	162,158	- 6.5%
3	216.83	326.62	50.6%	170,380	145,385	-14.6%
4	201.18	317.01	57.5%	164,622	152,067	- 7.6%
5	188.81	251.65	33.2%	166,948	156,095	- 6.5%
6	201.65	256.85	27.3%	154,224	147,334	- 4.4%

* To record fuel consumption in BTU's, the following conversions were used:

Fuel oil, 1 gallon = 138,700 BTU; Natural gas, 1 cu. ft. = 1,031 BTU;
Electricity, 1 kwh = 11,500 BTU; Coal, 1 ton = 24,580,000 BTU;
Propane gas, 1 gallon = 95,500 BTU.

TABLE IV

ESTIMATED EXPENDITURES FOR ALL FUEL

	Expenditures 1972-73 (000's)	Expenditures 1974-75 (000's)	New Expenditures (000's)	Equivalent Teacher Positions
National	$938,000	$1,452,000	$514,000	43,200*
Region 1	$ 61,811	$119,894	$ 58,083	4,900
2	139,289	238,669	99,380	8,300
3	116,576	194,542	77,966	6,500
4	113,011	178,944	65,933	5,500
5	233,693	352,340	118,647	9,900
6	72,295	100,481	28,186	2,400
7	63,261	77,697	14,436	1,250
8	26,946	35,989	9,043	800
9	81,452	112,817	31,365	2,650
10	29,468	40,932	11,464	1,000
Size 1	$252,296	$392,865	$140,569	11,800
2	189,470	270,332	80,862	6,800
3	165,790	279,346	113,556	9,500
4	165,575	272,706	107,131	9,000
5	127,421	182,391	54,970	4,600
6	37,689	55,263	17,574	1,500

*Based on current estimated average teacher salaries.

HOW TO READ THIS CHART: In Region 1, school districts spent almost $62 million on all fuels in 1972-73 ($61,811,000). In 1974-75 they spent almost $120 million, an increase of $58 million. Had that money been applied to teacher salaries, 4,900 more positions could have been filled.